

CLAIMS

1. A heat roller comprising a cylindrical sheet-like heating element having a resistance member embedded in an insulating member, an inner tube that comes in intimate contact with an inner surface of the sheet-like heating element and an outer tube that comes in intimate contact with an outer surface of the sheet-like heating element, wherein the outer tube has a non-linear shape seen in an axial direction.
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- 10 2. The heat roller according to Claim 1, wherein the outer tube is preferably formed into a reverse-crown shape seen in the axial direction.
- 15 3. A method of fabricating a heat roller comprising a cylindrical sheet-like heating element having a resistance member embedded in an insulating member, an inner tube that comes in intimate contact with an inner surface of the sheet-like heating element and an outer tube that comes in intimate contact with an outer surface of the sheet-like heating element, comprising:
20 arranging the inner tube on the inner surface side of the sheet-like heating element;
 arranging the outer tube on the outer surface side of the sheet-like heating element;
 inserting the inner tube, sheet-like
25 heating element and outer tube into a die having a non-linear inner shape seen in an axial direction; and
 supplying pressurized fluid to the inner tube to expand the inner tube, sheet-like heating element and outer tube toward the die for forming the outer tube
30 so as to match with the inner shape of the die.
- 35 4. A method of fabricating a heat roller comprising a cylindrical sheet-like heating element having a resistance member embedded in an insulating member, an inner tube that comes in intimate contact with an inner surface of the sheet-like heating element and an outer tube that comes in intimate contact with an outer surface of the sheet-like heating element, comprising:

arranging the inner tube on the inner surface side of the sheet-like heating element;

arranging the outer tube on the outer surface side of the sheet-like heating element;

5 inserting the inner tube, sheet-like heating element and outer tube into a die having a convex section or a concave section at its edge section; and

10 supplying pressurized fluid to the inner tube to expand the inner tube, sheet-like heating element and outer tube toward the die for forming the edge section of the inner tube into a shape having a convex section or a concave section corresponding to the convex section or the concave section of the die.

15 5. A method of fabricating a heat roller comprising a cylindrical sheet-like heating element having a resistance member embedded in an insulating member, an inner tube that comes in intimate contact with an inner surface of the sheet-like heating element and an outer tube that comes in intimate contact with an outer 20 surface of the sheet-like heating element comprising:

arranging the inner tube on the inner surface side of the sheet-like heating element;

arranging the outer tube on the outer surface side of the sheet-like heating element;

25 inserting the inner tube, sheet-like heating element and outer tube into a die,

arranging a ring member at an edge section of the inner tube, and

30 supplying pressurized fluid to the inner tube to expand the inner tube, sheet-like heating element and outer tube toward the die for forming the edge section of the inner tube so as to match with the inner shape of the die and the ring member is fixed to the edge section of the inner tube.